Edaphologia, No. 71: 17–23, February 28, 2003

A New Species of the Genus *Nothrus* from Central Japan (Acari: Oribatida: Nothridae)

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Received: 14 August 2002; Accepted: 10 October 2002

Abstract A new oribatid mite of the family Nothridae, *Nothrus undulatus* sp. nov., is described from litter and soil layer of natural forests of Arimine in Toyama, Central Japan. The new species is distinguishable from other closely related species of *Nothrus* mainly by large body size and long setae c_2, only slightly shorter than setae c_1.

Key words: Central Japan, new species, *Nothrus*, Oribatida

Introduction

The most recent revision of the genus *Nothrus* in Japan was made by FUJIKAWA (1999), who described eight new species from Hokkaido, Sado Island and northern Honshu of Japan. At this moment, 14 species are assigned to the genus in Japan. We add here one more species collected from the natural forests of Arimine at the foot of Mt. Tateyama in Toyama Prefecture, Central Japan.

Nothrus undulatus sp. nov.
(Figs. 1–17)

Nothrus sp. 2: SUMA, HIRAUCHI, ISHII, ISHIKAWA, SHIBA, NOMURA, SATO, ASAMA, ISHIZUKA, NAKAMURA, NEGORO and NUNOMURA, 2002, p.75.

Measurements and color (7 exs.): Body length 1080 (1142) 1188 μm; width 594 (629) 664 μm. Brown to dark brown.

Prodorsum: Surface covered with alveoli variable in size and form (Figs. 1 and 12). Rostrum split at tip, the part appearing to be a light spot surrounded by a dark frame (Fig. 3). Rostral setae (*ro*) spiniform, slightly roughened, 34–47 μm, shorter than their mutual distance (Fig. 3). Lamellar setae (*le*) bacilliform, minutely barbed, usually covered with a simple hyaline integument, 45–59 μm, only a little longer than half their mutual distance and their tips not reaching at the insertions of setae *ro* (Fig. 3). Interlamellar setae (*in*) slightly notched at tip, spatula-like in shape with a simple hyaline integument, 51–55 μm, about 0.3 × as long as their mutual distance, longer than setae *ro*, as long as setae *le* (Figs. 1, 3 and 4). Sensillus (*ss*) slender bacilliform, nearly glabrous with sparse minute barbs, 232–275 μm, about as long as distance between bothridia which situated far from each other (Figs. 1 and 4). Exobothridial seta (*ex*) glabrous, spiniform, with a simple hyaline integument (Fig. 4). A lateral round protuberance is present in front of leg I (Fig. 1). Relative lengths and distances of prodorsal setae: *ss* ≒ (*Bo-Bo*) > (*in-in*) > (*le-le*) > (*ro-le*) > (*ro-ro*) > *le* ≒ *in* > *ro* > *ex*.

Notogaster: Elongate; anterior margin almost straight, but the posterior margin strongly convex; lateral and posterior margin undulate (Fig. 1). Notogastral shield arched in central part, widest at level of setae e_2; surface covered with round or oval foveolae; interspace among foveolae slightly wider than in other species; the foveolae smaller and less distinct on marginal field of notogaster (Figs. 1 and 13). Central field wide; pairs of setae c_1, d_1, d_2, e_1 and f_1 inserted far from margin of central field; mutual distance of setae d_1 smallest. All notogastral setae more or less covered with a hyaline sheath, masking their actual shape (Figs. 1, 2 and 6). Each seta of *c*-, *d*-, *e*- and *f*- series with a sheath like a willow leaf, weakly pointed at tip (Fig. 2), while each seta of *h*- and *p*- series clavate, gradually thickened distally, except for seta p_3 short and sharply pointed at tip (Fig. 6). Actual shape of setae, when removed the covering sheath, only slightly

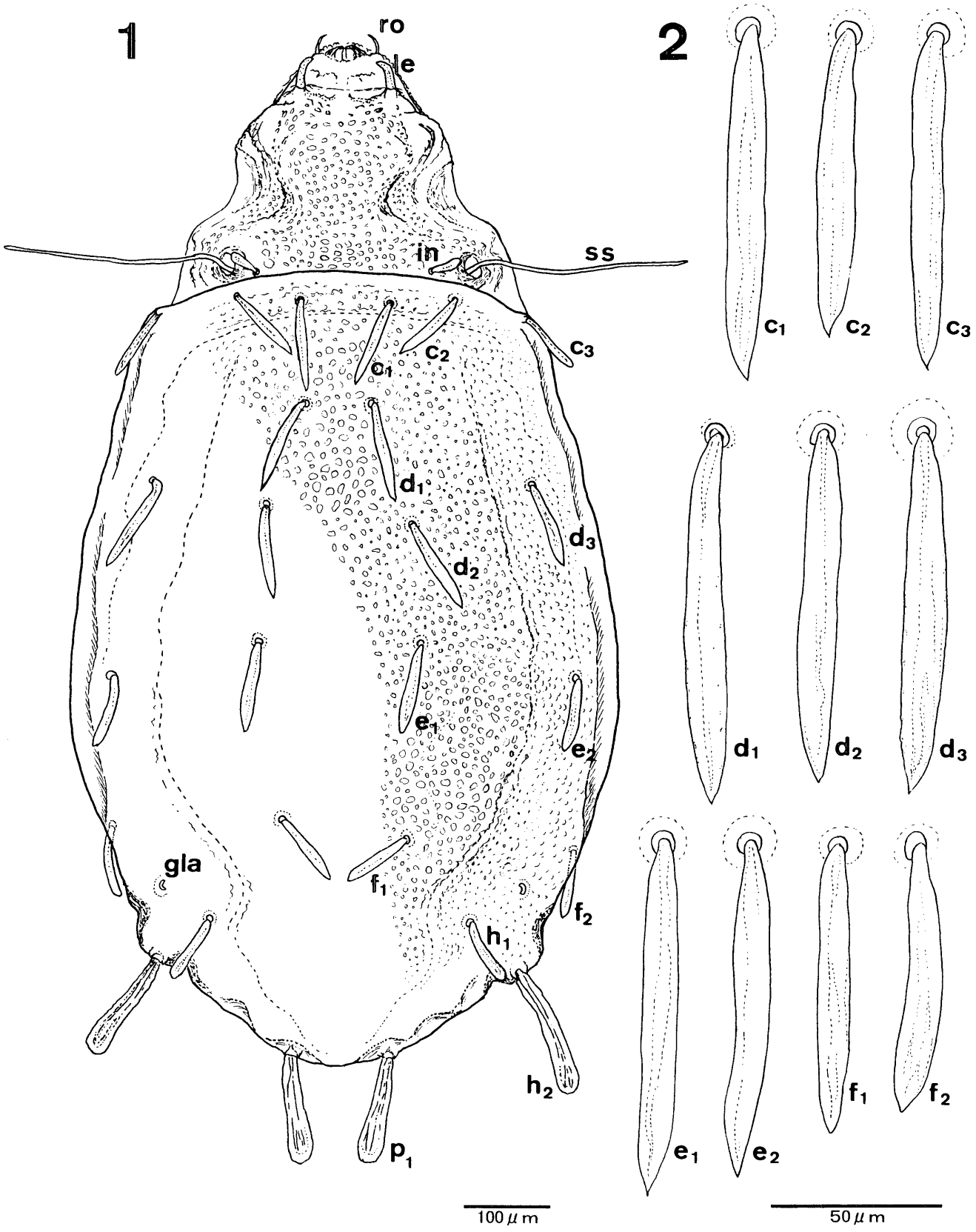
branched in *c*-, *d*-, *e*- and *f*- series and more distinctly branched in *h*- and *p*- series. Setae *c*-, *d*- and *e*- series approximately equal in length (*c*- series 92–113 μm, *d*- series 101–119 μm and *e*- series 96–118 μm), and longer than setae *f*- series (80–96 μm); seta c_2 inserted somewhat close to c_1; distance between c_2 and c_3 about 1.1 × as long as that between c_1 and c_2; seta c_2 subequal in length to, or slightly shorter than, seta c_1 (Figs. 1 and 2); setae h_2 and p_1 considerably branched under sheath layer, longer and wider than others; seta h_2 127–157 μm, 1.1–1.5 × as long as seta p_1 (105–135 μm), varied in length; seta h_1 64–81 μm, about one-half as long as seta h_2 (Fig. 6); tip of seta h_1 only slightly or not extending beyond the posterior margin of notogaster (Fig. 1); seta h_3 inserted at the level of insertion of seta p_2 (Fig. 8). Lyrifissure *im* aligned obliquely directed antero-laterad; *ip* lateral to gland opening (*gla*) (Fig. 5). Relative lengths and distances of notogastral setae: $h_2 > p_1 > c_1 \geqq c_3 \geqq c_2 > f_1 > f_2 \fallingdotseq (c_2\text{-}c_3) > (c_1\text{-}c_2) \fallingdotseq (c_1\text{-}c_1) > h_1 \fallingdotseq h_3 > p_2 > p_3$.

Ventral region: Ventral setae glabrous; setae *an*, *ad*, *g* and *h* with a simple hyaline integument (Figs. 7, 8 and 11). Genital setae g_1 inserted near lateral margins of plates; the remainder near inner margins of plates (Fig. 7). Epimerata III and IV separated medially; setal formula of epimerata: 6[7]–4[5]–5[6]–6; setae of epimerata I, II and III variable in number; epimeral setae glabrous, usually with a simple hyaline integument (Fig. 7). Tarsal setae of pedipalp glabrous; solenidion bacilliform; ultimal and superior setae pointed at tip; setal formula of pedipalp: 0–1–1–3–9 (Fig. 9). Infracapitular setae (*a*, *m*, *h*) glabrous; two pairs of median infracapitular setae (m_1 and m_2) inserted contiguously each other; seta *a* about twice as long as seta m_1; distance between setae *a* and m_1 considerably greater than that between m_1 and m_2 (Fig. 10). Relative lengths and distances of principal ventral setae: $a > ad_1 > (a\text{-}m_1) \fallingdotseq an_1 > h \geqq g_1 \geqq 4a > m_1 > m_2 \geqq (m_1\text{-}m_2)$.

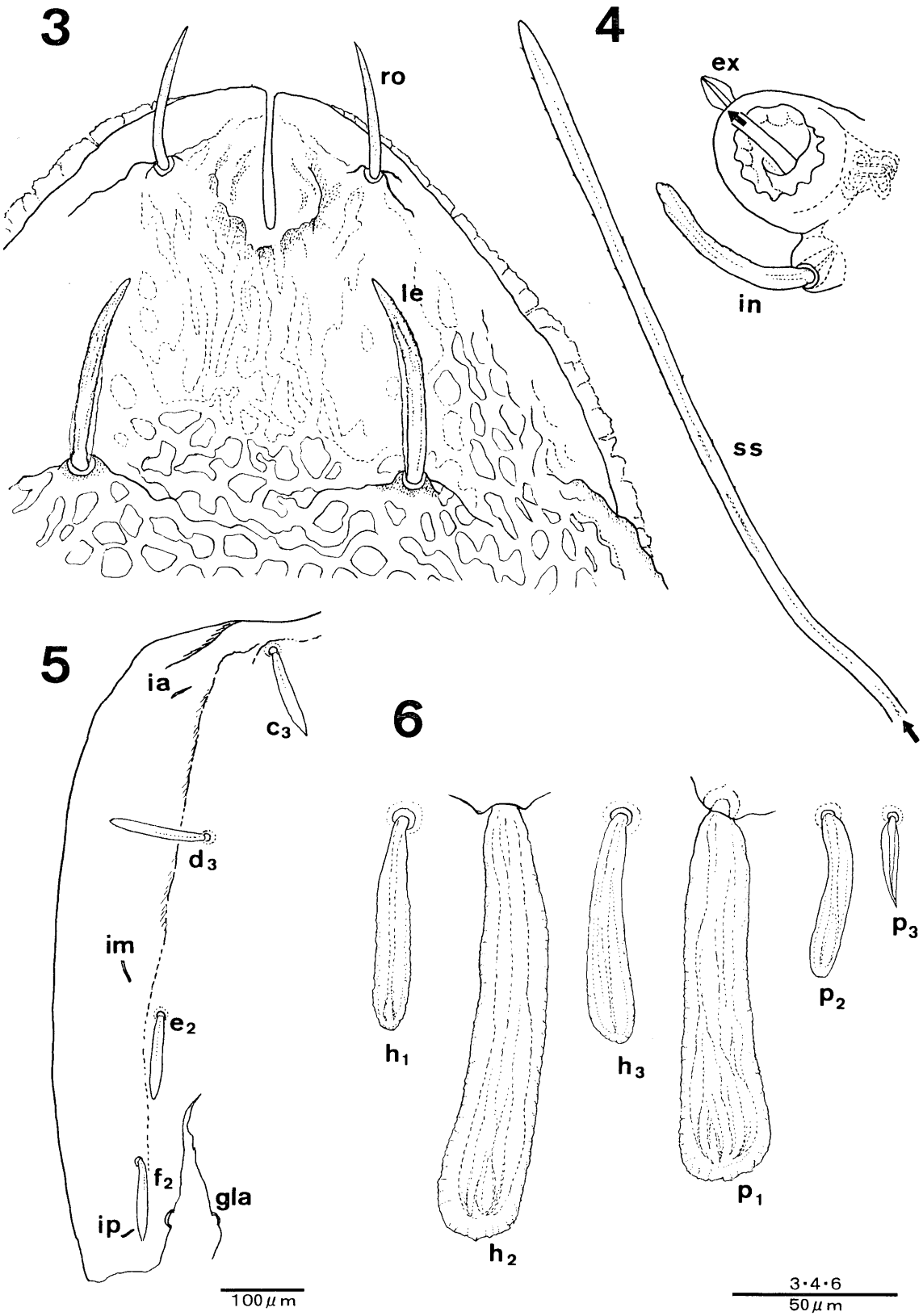
Legs: All legs heterotridactylous; all claws glabrous; median claw strong and lateral claws very thin. Leg chaetotaxy including famulus, but excluding solenidia: I (1–8–5–6–27); II (1–8–5–5–24); III (3–5–5–5–22); IV (2–4–4–5–22). Solenidiotaxy: I (1–2–3); II (1–1–1); III (1–1–0); IV (1–1–0). On tarsus I, all fundamental and accessory dorsal setae minutely roughened; solenidion ω_1 bacilliform; ω_2 and ω_3 setiform; ω_1 about one-half as long as *ft'*, and 1.7 × as long as ω_2; famulus ε about 0.7 × as long as ω_1, and longer than ω_2 and ω_3 (Fig. 14); ω_2 inserted antero-laterally to ω_1, and lateral to ω_3; ε inserted anterior to ω_2 and ω_3 (Fig. 17). Seta *d* shorter than solenidion on tibia I and genu I (Fig. 15).

Type series: Holotype (NSMT-Ac 11482, in spirit) and 4 paratypes (NSMT-Ac 11483–11486, 1 in spirit and 3 on slides): Tsubeta-dani (altitude 1,120 m), Arimine, Ohyama-machi, Toyama Prefecture, Central Japan, 9-VIII-1999, Y. HIRAUCHI, from litter and soil in the natural forest of *Betula platyphylla* SUKATCHEV var. *japonica* HARA; 5 palatypes (NSMT-Ac 11487–11491, 2 in spirits and 3 on slides): the same data as the above-mentioned holotype and paratypes but from forest of *Larix leptolepis* MURRAY in Nishi-tani, Arimine. The type series is deposited in the collection of the National Science Museum, Tokyo.

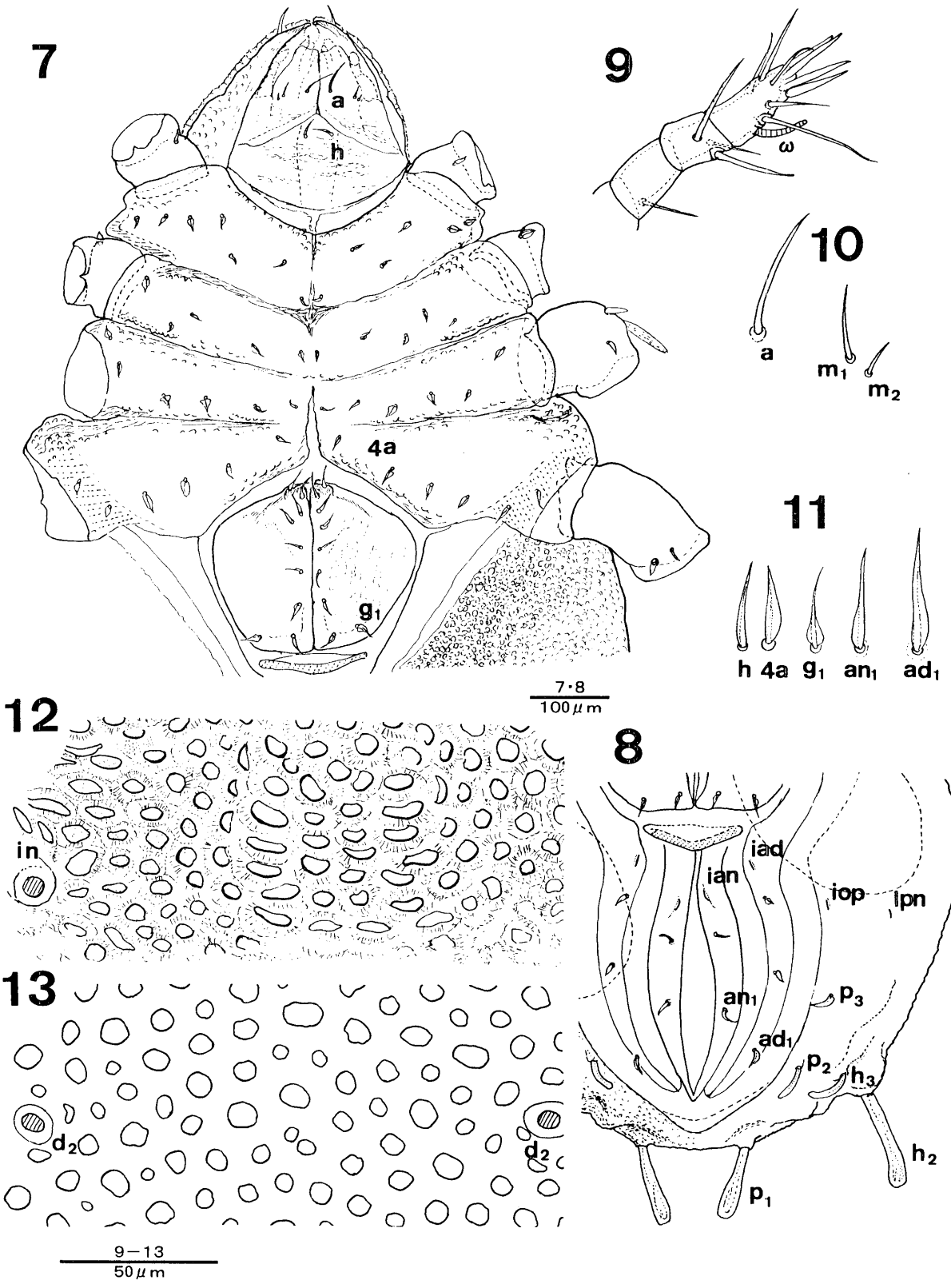
Remarks: In the strongly undulate notogaster, the present species, *Nothrus undulatus* sp. nov., is similar to *Nothrus rugulosus* BANKS, 1895, according to the redescription by SENGBUSCH (1951). The former is distinguished, however, from the latter by (1) far larger body size (815 × 400 μm in *N. rugulosus*), (2) setae c_1 longer than c_3, and (3) short setae h_1 about one-half as long as setae h_2. The following known species, *N. anauniensis* CANESTRINI & FANZAGO (= *N. biciliatus*: sensu AOKI, 1961, 1965, 1999, 2000), *N. borussicus* SELLNICK, *N. pratensis* SELLNICK, and *N. ishikariensis* FUJIKAWA, resemble the new species in the length and form of setae h_2 and p_1. However, the new species is different from the first species, *N. anauniensis*, redescribed by OLSZANOWSKI (1996), in (1) far larger body size, (2) spiniform rostral setae, (3) long notogastral setae c_2, only slightly shorter than setae c_1 (4) wide central field, (5) ventral setae usually covered with hyaline integument, (6) the presence of 24 setae on tarsus II, 4 setae on genu and femur IV, (7) long famulus ε, longer than half the length of ω_1 and longer than ω_2, and (8) the shape of notogaster, strongly convex posteriorly and undulating on postero-lateral margin; from the second species, *N. borussicus*, redescribed by SELLNICK & FORSSLUND (1955) and OLSZANOWSKI (1996), in (1) long notogastral setae c_2, (2) short setae h_1 about one-half as long as setae h_2, and slightly or not extending beyond the posterior margin of notogaster, (3) ventral setae usually covered with hyaline integument, (4) the presence of 24 setae on tarsus II, 8 setae on femur II, 4 setae on genu and femur IV, and (5) the shape of notogaster, strongly convex posteriorly and undulating on postero-lateral margin; from the third species, *N. pratensis*, described by



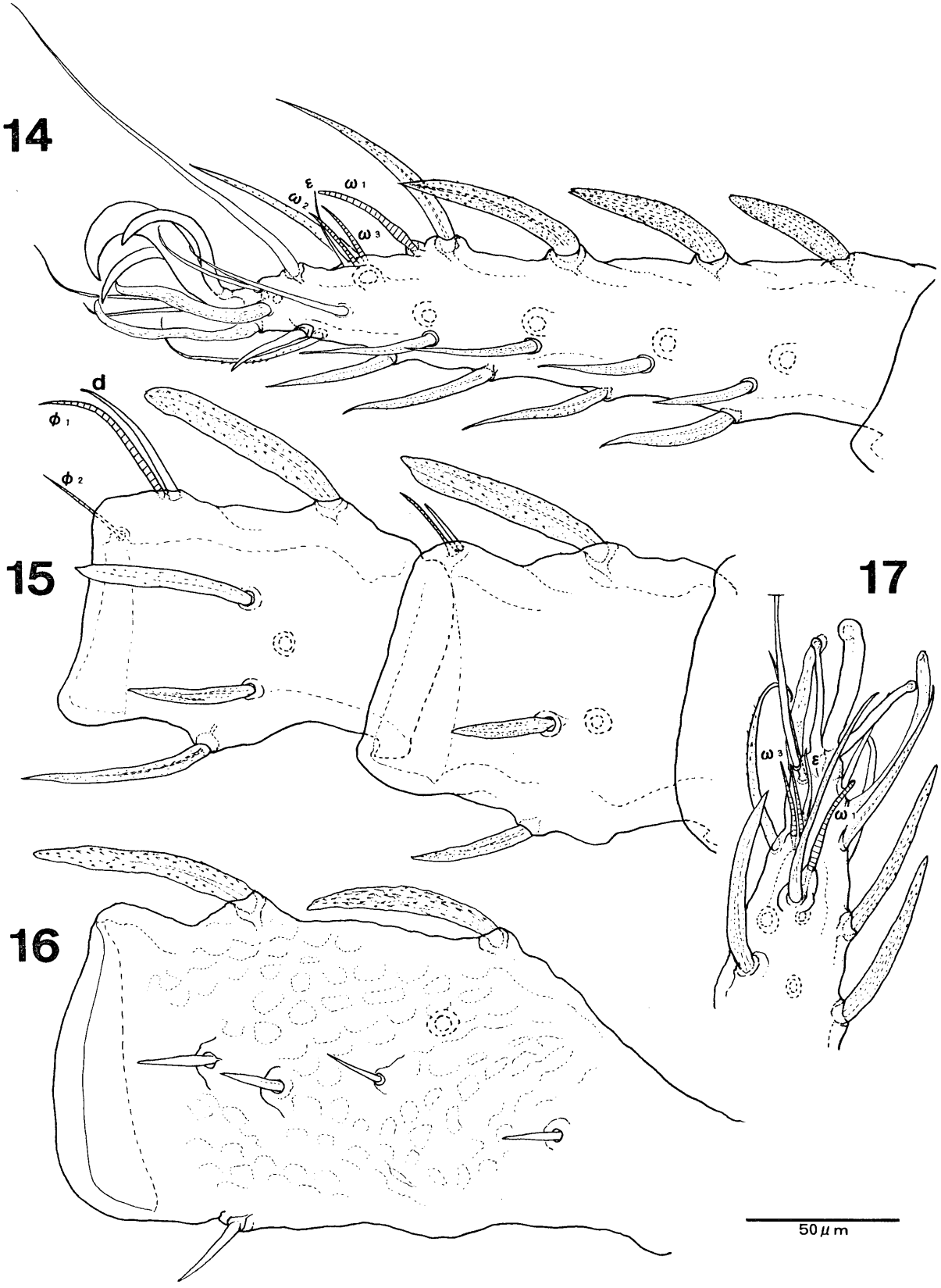
Figs. 1–2. *Nothrus undulatus* sp. nov. 1. Dorsal view; 2. Dorsal setae.



Figs. 3–6. *Nothrus undulatus* sp. nov. 3. Anterior part of prodorsum in dorsal view; 4. Left bothridial region. *ss*: sensillus; *ex*: exobothridial seta; *in*: interlamellar seta; 5. Lateral part of notogaster in dorsal view; 6. Posterior dorsal setae.



Figs. 7–13. *Nothrus undulatus* sp. nov. 7. Ventral view of gnathosoma and podosoma, 8. Anal region; 9. Pedipalp; 10. Anterior and median infracapitular setae; 11. Ventral setae. *h*: posterior infracapitular seta; 4*a*: epimeral seta; *g*: genital seta; *an*: anal seta; *ad*: adanal seta; 12. Microsculpture of prodorsum between setae *in*; 13. Microsculpture of notogaster between setae d_2.



Figs. 14–17. *Nothrus undulatus* sp. nov. 14. Right tarsus I; 15. Right tibia I and genu I; 16. Right femur I; 17. The tip of left tarsus I.

SELLNICK (1928) and redescribed by SELLNICK & FORSSLUND (1955) and OLSZANOWSKI (1996), in (1) larger body size and the shape of notogaster, (2) rostral setae shorter than lamellar setae, (3) long notogastral setae c_2, (4) ventral setae usually covered with hyaline integument, and (5) the presence of 2 setae on trochanter Ⅳ and 4 setae on genu Ⅳ; from the last species, *N. ishikariensis* FUJIKAWA, 1999, in (1) notogaster undulating on postero-lateral margin, (2) spiniform rostral setae, (3) short sensilli as long as distance between bothridia, (4) long setae c_2, only slightly shorter than setae c_1, (5) setae *c*-, *d*-, *e*- and *f*- series with a sheath, only slightly branched, (6) ventral setae glabrous and usually covered with hyaline integument, (7) setal formula of epimerata: 6[7]–4[5]–5[6]–6, (8) glabrous claws, (9) the presence of 24 setae on tarsus II, 8 setae on femur I and 4 setae on genu and femur IV, and (10) famulus ε inserted anterior to ω_2 and ω_3 on tursus I. The specific name *undulatus* refers to the strongly undulate notogaster.

摘　要

平内好子・青木淳一（富山県立新川女子高等学校　〒937–0011 富山県魚津市木下新 144・神奈川県立生命の星・地球博物館　〒250–0031　神奈川県小田原市入生田 499）：中部日本から見出されたアミメオニダニ属の 1 新種. *Edaphologia* No. 71: 17–23, 2003.

富山県大山町有峰のシラカンバ林とカラマツ林の落葉落枝層からアミメオニダニ科，アミメオニダニ属の 1 新種が発見されたので，*Nothrus undulatus* sp. nov.（アリミネアミメオニダニ）と命名し，記載した．本種は，体が大きいこと，後体部の後方側面が波打ち，後端が突き出ていること，背毛 c_1 と c_2 の長さの差が大きくないことなどによって同属の他種から区別される．

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